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The durability of informational signals and the content of advertising.

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ABSTRACT: The value of information conveyed from seller to buyer via advertising decays over time and across space. In consequence, the supply of advertising as specific, identifiable signals is shown to be a function of the durability of the signals conveyed. The general implication that price signalling and locational signalling will be conducted primarily by local vendors as opposed to national manufacturers is supported strongly by a sample of over 10,000 television commercials and 30,000 newspaper advertisements. (Reprinted by permission of the publisher.)

TEXT:

The Durability of Informational Signals and the Content of Advertising

The value of **information** conveyed from seller to buyer via

advertising decaysover time and across space. In consequence, the supply of **advertising** as specific, identifiable **signals** is shown to be a function of the durability of the **signals** conveyed. The general implication that price signalling and locational signalling will be conducted primarily by local vendors as opposed to national manufacturers is supported strongly by a sample of over 10,000 television commercials and 30,000 newspaper advertisements. There has been an increasing awareness in recent years of the importance of **advertising** as a source of product/seller-related **information** for consumers. The argument, as proposed formally by Ehrlich & Fisher, hereafter E-F (1982), is that potential purchasers "demand" **advertising** as a means of reducing the opportunity (time plus uncertainty) price of consumption; sellers respond by "supplying" **advertising** as **information**. Until now, virtually all of the empirical investigation in the **advertising** -as- **information** tradition has focused on the quantity of **advertising** supplied by sellers within an industry across media sources and/or by sellers across industries for specified media. From the standpoint of the consumer, however, the **content** of seller-supplied **advertising** may be of equal, if not greater, importance than sheer quantity. Two firms could supply an identical amount of **advertising** to consumers, as measured by the size of their respective **advertising** budgets, yet the net impact of the **advertising** could vary considerably from one firm to the other if the informational **content** of the **advertising** by firm A differed significantly from that of firm B.

The range of information which can be conveyed from sellers to potential customers is extensive: product price, seller location and/or telephone number, the availability of factory or dealer-sponsored financing, the rate at which financing is offered, acceptance of charge cards and/or local checks as a payment mechanism, available selection, hours/days of operation, hours/days of a sale, peripheral services offered (e.g., alterations at a clothing shop), size of seller, experience of seller, and factory or dealer-backed guarantees or warranties on the product/service being offered, to name a few. Observation, casual and otherwise, suggests that the typical content of ads across media varies significantly, and that the content of ads placed by different sellers in the same medium also varies significantly. The point of this paper is to demonstrate that the pattern of informational signalling within ads is

governed by basic economic principles on the production side. Provision of specific informational signals will occur as long as it is cost-effective for the advertiser to do so. Several implications which emerge out of this analysis are supported strongly by data collected from the Baltimore Sun daily newspaper and over 10,000 television advertisements.

The results reported in this paper bear heavily on at least two strands of research regarding the informational content of advertising. With respect to Strong's (1977) work on the spacing and timing of advertising, findings included here suggest that the timing of advertising must depend, at least partially, on the rate of decay of the information being conveyed. Since price information, for example, generally decays rapidly over time, ads conveying this type of information need to be aired relatively frequently. Other types of information decay less rapidly over time and advertisements containing this information need be aired less frequently than those conveying pricing information, all else being equal. With respect to the efforts of Dowling (1980) and Resnick and Stern (1977) to quantify the amount of information contained in advertising, the implications of this analysis are considerably stronger. Specifically, they suggest that their findings are highly medium-specific and highly dependent upon the types of informational characteristics sought in their analyses. The finding of Resnick and Stern that advertising is not informative, is due both to their focus on television commercials to the exclusion of other media and, perhaps more importantly, to their narrow categorization of informational characteristics in the ads coded. Findings of this investigation, which are based on massive samples of daily newspaper and television commercials, are much more in accord with those of Dowling (1980), who finds a substantial amount of informational transfer from sellers to would-be buyers via advertising.

This paper is presented as follows. A highly-simplified model of the advertiser's decision problem vis-a-vis incorporation of specific content into his/her ads is presented in the following section, and several implications of the model are discussed. Specific tests of the implications are then proposed, and the data, estimation technique employed, and results are reported. A discussion of the results is presented, and final comments and suggestions for further research conclude the paper.

The Content of Advertising

The starting point of this analysis is the recognition that consumers do not have perfect knowledge with respect to characteristics of products/services offered by sellers in market economies. This lack of knowledge "creates a wedge between the nominal price received by the seller and the full price borne by the buyer of a given brand. The difference can be termed information (or ignorance) cost. It represents search, transaction, and adjustment costs, as well as real outlays to reduce the likelihood of undesirable transactions, for example, by ascertaining the reliability of sellers or their ads" (Ehrlich and Fisher 1982). The full price paid by a buyer of a product is equal to the nominal (marked) price plus the value of the buyer's time spent in arranging the purchase, including obtaining information about the purchased item, competing brands, the seller patronized and competing sellers.

To paraphrase E-F's argument, the expected length of time "spent" per unit good purchased is a function of the total stock of knowledge available to the buyer about the commodity being purchased. The knowledge could be produced by either the would-be buyer, or by sellers via conventional media advertising and "other selling efforts." E-F do not address the issue of efficiency in production of informational advertising.

This investigation takes its point of departure from the E-F analysis. It is precisely the issue of productive efficiency that determines the specific informational characteristics included in advertisements supplied by sellers. Since a shopper's time investment is a function not only of quantity of advertising supplied by sellers, but also of informational content, there is a need to analyze advertising in terms of the individual informational signals contained therein.

It may frequently be the case that the marginal cost to the seller of inserting an additional informational signal into an ad is effectively zero, as in the case of purchasing television commercial time. One pays for

the time itself, and an advertiser is able to include any legal sales inducement desired in that time frame. The zero marginal cost of the signalling scenario implies that the decision to include specific informational signals in any particular advertisement is based purely on the anticipated influence on sales, with signals provided as long as the inclusion of a specific informational tidbit affects expected sales positively. Indeed, the time constraint faced by sellers purchasing television time may require an advertiser to provide only those informational signals that are most valuable, to the neglect of others whose expected marginal returns are lower, but still greater than zero.

As E-F argue, the effectiveness of advertising "depends on efficiency parameters such as the complexity of the product, the diffusion of potential buyers, the number of alternative brands available and the buyer's prior knowledge," which is largely a function of exogenous factors such as the buyer's education, experience, and length of residence in the market area; to some degree it is also the result of purposive search. With respect to the content of advertising, the list of efficiency parameters should be lengthened to include institutional characteristics of the medium (media) employed, such as the frequency of issuance and audience coverage, durability (in time and space) of the message contents, and the "attractiveness" of the advertising to the recipient, both immediately, and for the several seconds thereafter.

The implications drawn from this simplified analysis concern the issue of the durability in time and space of specific informational signals that might be supplied by advertisers. First, despite the fact that programs and ads air daily, we should not expect to observe as much provision of price information in television commercials as we observe in newspaper ads. Moreover, to extend the argument to its logical conclusion, we should not expect to observe as much price signalling in television commercials aired nationally by manufacturers as compared to those aired locally by retailers (certain products, such as air travel, excepted). This is because price information is not very durable in a spatial sense. The per gallon price of Exxon regular unleaded gasoline, for example, may vary several pennies from one Exxon dealer to another within the same metropolitan area, and more than that from one metropolitan area to the next. Similarly, we should not expect Ford Motor Company to provide specific information about the prices of its cars via ads placed in national media, since exact prices, within a wide range, are subject to the discretion of local leaders.

This suggests that the cost effectiveness to Ford Motor Company of providing price information via national media is low relative to the cost effectiveness of providing some other type of informational signal. Conversely, local Ford dealers will find it cost effective to supply price information in their ads. Taking all products together, it should generally be the case that supply of price information in ads placed by sellers should be greater in local media than in national media. In addition, incidence of price signalling should be greater for products targeted to a highly-localized audience as compared to products marketed to a national audience.

Second, seller provided locational information should occur more frequently in local media than in national media, for two reasons. First, the relevant market for the vast preponderance of producer/sellers is local as opposed to national; this suggests that locational messages will be supplied via local media, since that implies maximization of cost effectiveness. Second, producers of products/services that enjoy a national constituency normally distribute their commodities through local dealers, with acknowledged exceptions. It would not be cost effective for a firm of this sort to convey locational information via national media sources, especially in the opportunity-cost sense. Chrysler Corporation, to take but one example, distributes its product via literally hundreds of retail outlets across the United States. In theory at least, the company could contract for a 60-second commercial on television and list the locations of all of its dealerships, or at least as many as possible, in that time interval. The effectiveness of the ad is likely to be small in comparison to other types of information that could be conveyed in that same time

frame. Any given observer of that ad would only possibly derive value from the tiny portion of the ad that pertained to his/her location and the remainder of the ad content could be ignored. A 60-second commercial that informs viewers of Chrysler's 7-year, 70,000-mile warranty on every automobile that it produces would likely to be more cost effective from the standpoint of the auto manufacturing firm. It would make much more sense for the local Baltimore-area Dodge/ Chrysler-Plymouth dealers to provide that locational information via ads placed in the Baltimore Sun daily newspaper. This is doubly true in the case of locational information, given the role ascribed by E-F to complexity in determining advertising efficiency. They were concerned with product complexity: however, informational complexity is also important. Locational information supplied via the audio/visual media is likely to be forgotten relatively quickly; therefore, the expected value (efficiency) of that type of signal conveyed over that type of medium is arguably low in comparison to locational information provided in a hard-copy source like the local newspaper, which can be carried by the recipient at relatively low cost. The probability that the potential customer retains, and therefore utilizes, locational information is much greater in the latter case than in the former.

Third, the anticipated local-versus-national differences with respect to price and locational content of ads should not necessarily occur vis-a-vis the signalling of more time/space-durable information such as seller experience or product guarantee/warranty information. The differences should not be as large for two reasons. First, since time is the binding constraint with respect to television commercials, experience and warranty information is a likely inclusion by advertisers of nationally-oriented products for whom the durability/efficiency of such information is greater than that of price/location information. Second, experience/warranty information is not a likely inclusion by sellers of locally-oriented products, since the efficiency of price/location information arguably exceeds that of experience/warranty information in that context and only the most highly-valued information can be included given the time constraint. This is not to argue that experience and warranty information will never be provided by advertisers of locally-focused products; the rate of inclusion of such signals for local products may indeed exceed that of nationally-focused products, for good reasons. Certain warranties, for example, are shop or dealer-specific, as opposed to factory sponsored. Local shops may have refund policies that guarantee customer satisfaction. Similarly, shops unique to a specific locale may advertise that they have been serving satisfied customers for X number of years. The point is that the difference in the incidence of price/location signalling between locally- and nationally-focused products should exceed the difference in the incidence of experience/warranty signalling between locally- and nationally-focused products. These implications are investigated empirically in the following section.

Methodology

The data employed in this investigation are derived from two sources: the Baltimore Sun daily newspaper, morning edition, and television commercials. From the former source, information regarding specific content of ads was collected from all non-classified advertisements placed in the national, sports, business, and entertainment sections of the newspaper, Sunday through Saturday, for all of 1986 (sample size = 30,940). Among the specific information collected for each ad was included: the presence or absence of (1) price information, (2) a low price guarantee, (3) seller financing, (4) seller acceptance of third party credit cards, (5) a picture or reproduction of the product(s) being sold, (6) the address or telephone number of the seller, (7) information regarding product guarantees/warranties, (8) information regarding seller size/selection, (9) information regarding the experience of the seller, and (10) information regarding the hours/days of operation by the vendor. Each informational characteristic was coded as a separate 0-1 dummy variable. The author was the sole coder. Mention of specific prices for identified items was the criterion for an ad to be recognized as containing price information; claims of general sale prices (e.g., 30 percent off all items storewide) were not counted as price information. Categories (2) and (3) are

self-explanatory. Seller acceptance of a third party credit card (Visa, MasterCard, etc.) is frequently advertised via insertion of a small reproduction of the card(s) in the ad, although occasionally the information is conveyed via printed words. Categories (5) and (6) also are straightforward. An ad was classified as including guarantee/warranty information if it included any representation to the effect that customer satisfaction was guaranteed, including the FDIC or FSLIC memberships advertised by financial institutions. Any representation with respect to available stock of merchandise for customer inspection counted as size/selection information. For example, a car dealer who advertised "five acres of automobiles," or a clothier who boasted a "ten-million-dollar inventory," were considered to provide size/selection information. Examples of seller-experience information include claims such as "40 years experience," "third-generation ownership," and "serving satisfied customers since 1909." The price, location, guarantee and experience categories of informational content were also collected for each of 10,416 television commercials aired during the period December 1985-October 1986. Means and standard errors for the variables in question are reported in Table 1.

Results Implications discussed earlier concerned the provision of price and locational information in locally-focused, as opposed to nationally-focused, media and between retail sellers and manufacturers. Point of purchase and price data are generally specific to particular locales; the content deteriorates rapidly as the distance between the consumer and the locale increases. This suggests that it will be more cost effective for pricing and locational signals to be supplied to a greater degree via local media than via national media, *ceteris paribus*.

A comparison of the means presented in Table 1 provides strong support for this proposition. The one-tailed test indicating that incidence of price signalling in the local newspapers, across all sellers generally, exceeds that in television commercials, is significant at the 0.01 level ($t = 92.44$). Similarly, the one-tailed test indicating that evidence of locational signalling in the local newspapers exceeds that in television commercials is even more significant ($t = 165.27$).

As part of the data collection effort vis-a-vis both sets of ads, each ad was identified as to whether the seller was a retailer or a manufacturer. The dichotomy is not difficult to measure empirically, and permits the further testing of the stated implications, holding constant the medium used to convey the advertisement. For the reasons discussed earlier, it was predicted that provision of price and locational information by sellers would be greater among retailers than among manufacturers. The data presented in Table 1 support this prediction as well. In the newspaper sample, retailers supply pricing information at a rate more than three times as great as do manufacturers ($t = 40.79$); on television, retailers' commercials are eight times more likely to contain pricing cues than those placed by manufacturers ($t = 22.45$). With respect to provision of locational information the differences again favor retailers over manufacturers, with an extremely large difference noted for television ($t = 55.75$) and a smaller but nonetheless distinct difference noted for newspaper ads ($t = 13.33$).

Finally, Table 1 sheds empirical light on the third implication, regarding seller provision of guarantee/warranty information and experience. The prediction was that in a relative, but not necessarily absolute sense, these two informational signals are more likely to be in ads placed by manufacturers than retailers. Again, the data tend to validate the prediction. Although, in an absolute sense, retailers supply more ads with guarantee/warranty and experience information than manufacturers in both television and the newspaper, the differences do not favor retailers nearly as much as the differences with respect to signalling of price and locational information.

Discussion Although the theoretical and empirical analysis contained in the previous two sections were concerned primarily with the decay of information in a spatial sense, it should be clear that the argument generalizes to the decay of information over time. Since price information, for example, decays rapidly over time, ads conveying this type of information need to be aired frequently. Other types of information decay

less rapidly over time, and ads containing that type of information need be aired less frequently than those conveying pricing information, all else being equal. With respect to Strong's (1977) work on the spacing and timing of advertising, these findings suggest that the timing of advertising must depend, at least partially, on the rate of decay of the information being conveyed.

Considerably stronger implications for the findings of Dowling (1980) and especially Resnik and Stern (1977) emerge out of the foregoing analysis. Resnik and Stern analyzed the informational content of 378 television commercials broadcast by the three major networks. Although they admit that the informational content of an ad is specific to the viewer, they base their analysis on fourteen aspects of information that a seller could potentially include.

Their findings are stunning, to say the least. They find that less than 50 percent of the ads aired on television contain any informational content. They can be no question but that their sample suffers from a selectivity problem that favors the finding of their result. Commercials broadcast in programming provided by the national networks are predominately those of manufacturers, rather than of locally-based retailers. The latter are more likely to broadcast on local channels. As the data presented here reveal, manufacturers are much less likely to supply pricing and locational information than are retailers. It seems consistent to argue that manufacturers will also be less likely to supply information regarding availability or special offers. Resnik and Stern's focus on network broadcasting targets advertising by manufacturers, and thus, works against their finding informational inclusions of the sort they are seeking. To drive home the point, it is useful to take another look at Table 1. Over 50 percent of the retail advertisers on television in this sample, which overall is some 30 times larger than that used by Resnik and Stern, provided price information; 63 percent provided locational information. In fact, of the 2,346 television ads placed by retailers, 86.19 percent included at least one of the four attributes listed above (price, location, guarantee/warranty, experience). This figure is somewhat higher, but much closer to that obtained by Dowling (1980), whose sample of Australian television ads was more regional in nature, and thus, more likely to include advertising by retailers.

Moreover, Resnik and Stern's (1977) choice of media in conjunction with their particular informational characteristics operates against the likelihood of finding much informational content in advertising. In the sample of Baltimore Sun advertising used here, for example, fully 99.5 percent of all the ads placed contained at least one of the informational characteristics specified previously (standard error equals 0.069). The mean ad contained 3.311 specific informational tidbits, with a standard error of 1.665. These results are consistent with Pollay's (1985) results for magazine advertising, in which he finds a large amount of information supplied by sellers.

Advertising as Persuasion vs. Advertising as Information The more insidious issue raised by Resnik and Stern concerns the nature of advertising itself. If it isn't informative, just what is it? Do advertisers control consumer behavior through advertising? The bottom line of the advertising-as-information hypothesis is that producers chase demand curves. Although there is apparently a widespread and deeply-held belief in the notion that advertising "persuades" individuals to purchase items, such a concept is repugnant to adherents of the former hypothesis, because it suggests that producers generate demand curves, with the implied degeneration of consumer sovereignty in the marketplace. In point of fact, the two theories seem remarkably similar. Persuasive techniques aid in the transmission of informational content from seller to buyer. It should be clear, however, that what "persuades" a consumer to act is the information received; "persuasive" advertising technique merely influences the efficiency in transfer. Advertisements for Calvin Klein's "Obsession" perfume transmit an informational message to the effect that use of the product will increase the user's attractiveness to members of the opposite sex. Calvin Klein could have utilized magazine ad space in typeset that read: "Buy Obsession--Your Sex Life Will Improve." Instead, the

advertisement included a small picture of the perfume bottle along with a large, sexually-suggestive photograph of a semi-clad woman surrounded by attentive, semi-clad men with no copy. The informational content of the message conveyed is the same, it is the method of transfer that differentiates the two advertisements. This is not to suggest that a seller always conveys informational truths about his product to would-be-buyers. Regardless of the transmission technique employed, including use of so-called "image" advertising, individuals consume seller-produced information at their own risk. There is a certain mean and variance around the veracity of information provided via each technique that influences its cost-effectiveness to the seller. To suggest that users of seller-provided information are ignorant of this fact or that market mechanisms do not exist to minimize this type of transaction cost seems farfetched. For that matter, the very fact that would-be consumers of goods and services engage in any informational-search behavior at all implies that they are aware that the informational-exchange process between sellers and buyers is not without cost.

Resnik and Stern (1977) have failed to identify relevant informational inclusions in the advertisements they sampled. The ad for Obsession perfume clearly provides potential consumers with information about the product's performance, one of Resnik and Stern's (1977) 14 criteria, yet one might suspect that in their reading, the ad would be marked as having no informational inclusions. Sellers qua advertisers are smart enough to realize that they must, in some manner, educate consumers about their products. The mere fact that some researchers are unable or unwilling to recognize certain types of informational content, whether they approve of the transmission mechanism or not, does not imply that relevant informational cues are not supplied by sellers to buyers via advertising.

Conclusions The purpose of this paper was to demonstrate that the same cost effectiveness principles that govern the supply of advertising as a gross quantity also apply to the supply of specific informational content of ads. One aspect of the efficiency of advertising is the durability, in time and space, of the particular datum being conveyed. The prediction that suppliers are more likely to include pricing and locational signals in their most durable-relevant markets was amply borne out by the data. Local media are more likely to carry ads that include pricing and locational signals than national media, and, within the context of a given medium, such signals are more likely to appear in ads for products/services/vendors specific to the local broadcast area than in ads for products, etc., targeted to a national audience.

Additional research is suggested by this type of analysis. In particular, there arguably will be differences in signalling behavior of vendors marketing Nelson's (1974) so-called "search" goods, as compared to those marketing "experience" goods. Informational differences in signalling given products should appear from one part of the country to the next and from one time of the year to the next, for plausible reasons. This research is left to future investigators.

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CAPTIONS: Means on selecting characteristics of newspaper and television ads. (table)

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Advertising as information: further evidence.

Mixon, Franklin G.

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ABSTRACT: Yellow Pages advertising conditioned the relationship between supply of product quality and consumers' expected marginal return. Such advertising information content is affected by consumer time costs. An intra-city data set covering NY city and Los Angeles, CA, showed that advertising spurred the market process. Sellers limit consumer product search costs through advertising information.

TEXT:

I. Introduction

In the past 30 years, the economics of **information** has become an important feature of the revolution in modern microeconomic theory. The seminal literature includes theoretical advances by Stigler [10], Nelson [7; 8], Spence [9], and Darby and Karni [1]. In an original approach, **Laband** [3] tests the proposition that the supply of product quality **signals** increases with a rise in the expected marginal return to consumers utilizing Yellow Pages advertisements in various urban settings. In later expositions, **Laband** [4; 5] provides further evidence of the "durability" of the informational **content** and the differences in **information** provision of television and commercial advertisements for different types of goods. The present paper extends and provides alternatives to **Laband** 's tests of the impact of time costs (faced by consumers) on the informational **content of advertising** . This study employs a supplementary category (to **Laband** 's) of credence goods developed in the literature [2; 6], and analyzes the impact of income as a proxy for time and **information** costs with a unique, intra-city data set from New York City and Los Angeles.

II. Modeling Intra-City Information Provision

Demanders of all types of goods will, ceteris paribus, attempt to minimize the full transaction (money plus information plus time) costs of exchange. Consumers will search for goods and services up to the point where their marginal benefits of search equal the marginal costs of search. The opportunity cost of time is a central element in the consumer's marginal search costs, as are the institutions and technology comprising the relevant market area and the supply of information within which the consumer functions [2]. Recent studies have shown that consumer characteristics (i.e., income, mobility) are important determinants of the level of information provision in yellow pages advertisements. Consumer income and mobility (as proxies for the opportunity cost of time) are positive determinants of the number of informational cues within yellow pages ads, because sellers have profit-based incentives to help consumers "economize" on search time, thus minimizing the full price of goods and services [2; 3; 5]. Goods characteristics have also been shown to play important roles in the number and type of informational cues within advertisements. Following Nelson [7; 8], search goods are those for which judgements regarding product attributes/quality can be made by consumers prior to purchase, and experience goods are those for which such judgements can be made only after purchase. Therefore, the number of informational cues within ads for experience goods will be greater than for search goods, and that the information about experience goods (and their suppliers) will be indirect (e.g., the seller's experience, licensure/certification of the

seller). **Laband** [3] finds that information provision for experience goods is greater than that of search goods using Yellow Pages data (large ads) from Washington, D.C. and Baltimore, and that because of greater buyer-mobility (as a proxy for opportunity cost), search (experience) goods ads in Washington, D.C. were more information-intensive than search (experience) goods ads in Baltimore. (1) Darby and Karni [1] point out that a third category, credence goods, is represented by goods for which judgements about product quality may be impossible (or too costly) for consumers to make, even after purchase/consumption. A recent study has provided limited evidence that the informational cues of credence good ads are much like those of experience goods [2]. (2)

In this empirical note, I investigate whether seller provision of information is sensitive to predictable differences in consumer demand for such information. Specifically, I test two propositions: (1) that seller-provided informational cues in advertising increase as consumer income increases (and the opportunity cost of search behavior increases) and (2) that sellers of credence goods provide more informational cues in advertising than do sellers of search goods.

New York City is divided into well-known districts, including the Bronx, Brooklyn, Queens, and Manhattan. Los Angeles is divided into several districts, including San Fernando Valley, Redondo Beach, and Beverly Hills. The different income characteristics provided within these city-districts create different information demands (per-capita). Following previous work, an increase in the opportunity cost of time (proxied by income), *ceteris paribus*, is expected to decrease the demand for time-intensive kinds of search for product information. Sellers will respond to the higher time costs faced by consumers with higher per-capita incomes by providing more information-intensive Yellow Pages advertisements for search, experience, and credence goods. However, product characteristics (search, experience, and credence) are also important. Holding income constant, advertisements for experience/credence goods are expected to provide more (and more indirect) informational cues than ads for search goods.

Using the goods classifications pioneered by **Laband** [3] and Ekelund, Mixon, and Ressler [2], I estimated the following empirical relationship:

$$\text{LIC/CERT/EXP} = [\text{a.sub.0}] + [\text{b.sub.1}]\text{ADSIZE} + [\text{b.sub.2}]\text{EXP} + [\text{b.sub.3}]\text{CRE} + [\text{e.sub.i}]. \quad (1)$$

The unit of analysis is display ads in the consumer yellow pages for each city-district. The dummy variable LIC/CERT/EXP is constructed for each city-district and assigned the value of one if the advertisement mentions any of the following: (a) licensing of the seller, (b) certification of the seller, (c) experience of the seller. The variable is equal to zero otherwise [5]. As independent variables, the model includes ADSIZE, which is the number of square inches of the yellow pages ad, and EXP, a zero-one dummy variable which assumes the value of one for an experience good, and zero otherwise. CRE is a dummy variable which assumes the value of one for a credence good, and zero otherwise. Here, the omitted category is that of search goods. Following **Laband** [3; 5], it is expected that the signs of EXP and CRE will be positive because of the nature of experience and credence goods (as compared with search goods). Yellow Pages ads will be more likely to convey any one of these pieces of indirect information regarding product quality for experience/credence goods than for search goods. Also, ADSIZE is expected to be positively related to the dependent variable because larger ads will contain more informational cues, *ceteris paribus* [5].

The micro-data used in this study provide parameter estimates (from a logit regression) for each city-district (across goods-classifications) which approximate the logarithm of "the odds" that a given advertisement will contain any one of these three indirect informational cues. The parameters can be compared across districts (within each city) as a test of the impact of the opportunity cost of time on the demand for informational cues that reduce the costs of search. Therefore, this study posits that the parameter estimate for EXP and CRE will become larger as per-capita income rises across city-districts.

The logit regressions are reported in Table I. (3) For New York City, the parameter estimates are all positive and significant at the 1% level.

Given the omitted category of search goods, both variables EXP and CRE are positively related to the provision of the suggested informational cues within the yellow pages ads. The behavior of the experience goods parameter is generally consistent with the theories of Nelson [7] and **Laband** [3], because the logit parameter generally rises across districts as per-capita income rises. The only exception is the parameter difference between Bronx and Brooklyn, but the income difference between these two districts is not significant. The evidence on credence good information-provision and income is less conclusive, given the nature of the parameter estimates of CRE.

The demographic characteristics of the Los Angeles districts are more distinct, and the regression estimates are more supportive of the Nelson-**Laband** framework. Here, all of the independent variables are positive and significant at the 1% level, with the estimates of EXP steadily rising across city-districts. As the opportunity cost of search rises for consumers, producers appear to respond by providing more information-intensive ads that help to lower the full price of goods and services to consumers.

Again, the estimates for credence goods characteristics appear somewhat erratic across city-districts. It may be that diminishing returns to the benefit of search (for quality) arrive rapidly in the case of credence goods. As income rises, the magnitude of the costs of informational search regarding credence goods is extremely high. The expectation that one will understand quality characteristics (over some relevant time frame) is low for many credence goods. Other things constant, consumers may well demand more information for goods with experience than for credence characteristics. When comparing experience goods parameters with credence goods parameters, the evidence for New York City appears mixed. The Los Angeles models suggest that information provision may be greater for experience goods than for credence goods; by examining the Los Angeles parameter estimates, it appears as though some threshold limit is reached on the credence goods parameter at a per-capita income level of \$20,000.(4) Additionally, many of the credence goods chosen (e.g., palm readers, marriage and family counseling, and psychology) conform to [TABULAR DATA FOR TABLE I OMITTED] the definition of pure credence goods, demanding the "highest cost" in the search for product attributes and product quality. Overall, the models work to support the theoretical advancements made by Nelson and others regarding the economics of information and the positive role played by advertising in the market process.

III. Concluding Comments

This study has added to the body of evidence that reveals the positive role of advertising in the market process. The results of my analysis of yellow pages advertising in New York City and Los Angeles support the findings of previous researchers in this tradition - sellers respond to the search costs that consumers face by producing information about products in a manner that minimizes the total cost of voluntary exchange.

1. "Large" ads are defined as ads containing more information than seller's address and telephone number. **Laband** 's search goods include service stations, restaurants, pharmacies, transmissions, lumber, liquor stores, bakeries, books (retail), bicycles, and photo-finishing. **Laband** 's experience goods include ~~plumbing~~, pest control, electrical contracting, jewelers, janitor service, roofing contractors, men's clothing, travel agencies, welding, and carpet cleaning.

2. The credence goods chosen by Ekelund, et al. include home security systems, palm readers, martial arts schools, marriage and family counseling, tax services, child daycare, podiatry, optometry, psychologists, and transmissions.

3. Means-differences tests in the form of **Laband** [3] and based upon the same theory and expected outcomes are reported below in the Appendix.

4. One could argue that for districts of high per-capita income such as Beverly Hills, household employees are paid to make such purchase decisions (demanding less information), and producers of informational cues respond accordingly.

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